

ENVIRONMENTAL GEOLOGY AND MINING SAFETY

Syllabus Fall 2022

Course Code:	AGEO 214
Course ID:	4490
Enrollment Key:	TBA
Course Instructor:	Dr. Kubatbek Muktarbek uulu muktarbek_k@auca.kg
Course Duration:	10-11 Weeks
No. of Credit Units:	3.0
Class meeting/Time:	Friday 12:45 – 14:00
Mode:	OFFLINE
Office Hours	By appointment

COURSE DESCRIPTION

Environmental geology is an applied science concerned with the practical application of the principles of geology in the solving of environmental problems. It is a multidisciplinary field that involves the study of the interaction of humans with the geologic environment, including the biosphere, the lithosphere, hydrosphere, and atmosphere.

This course focuses on the fundamentals of geology with an emphasis on human interaction with geologic environment, and problems associated with exploitation of geologic resources such as water and air pollution and climate change. We will explore natural processes and anthropogenic (human-impacted) effects on these processes in the context of natural hazards, natural resources and sustainability, and mining exploration.

In the context of mining, we will learn about mine safety management and activities. Will be provided basic knowledge on the subjects of mine ventilation, mine fires and explosion, mine gas and mine dust with case studies.

LEARNING OBJECTIVES/OUTCOMES:

Understand the principles of managing geological and hydrogeological resources such as fossil fuels, minerals, water and land use.

- Evaluate natural hazards and disasters; analyze the problems associated with resource extraction and waste disposal, and select appropriate mitigation strategies.
- Discuss evidence of global climate change and possible impacts of anthropogenic

warming

- Explain the causes of soil, air and water pollution
- Apply mine safety principles to open-pit and/or underground mining practices.
- Solve practical mine activity problems related to the safety and health hazards during mining.

COURSE RULES & POLICIES

The course objectives will be achieved through instructional model such as lectures and seminars. Instructor would use PowerPoint presentations for lectures.

Reading Materials:

Instructor prepares required materials for students. Necessary course materials, including the course Syllabus, can be found on the course website in the e-course.

Each student has to read required readings that are indicated for each section before the class and students should come ready to present, argue and discuss them. The reading materials are the main responsibility of the students in order to pass this course.

WORK AND ATTENDANCE: The work and attendance of all students will be monitored. Students are expected to attend all lectures and seminars. Attendance is regarded as a part of the course. This is for the benefit of the students and helps to ensure that they are coping with the work and managing to comprehend all the information and complete all the tasks given to them. Students must come to class on time not to disturb others, being more than 15 minutes late is counted as an absence. Students are not allowed to use any mobile devices or portable computers in class. Students are not allowed to use any mobile devices or portable computers in class, this is considered as a “negative” participation and participation points be deducted for that.

DOCUMENTATION OF REASONS FOR ABSENCE: Any valid reasons for absence should be reported to the Instructor as soon as possible. Legitimate excuses are the following: illness, confirmed by a doctor's note next class; a death in the family; participation in conferences or seminars with preliminary notification of the Instructor and submission of the relevant supporting documents. Unless the correct procedure is followed no allowances can be made.

READINGS, SUPPLEMENTARY MATERIALS & ASSIGNMENTS - To be posted on the e-course

1. Montgomery C.W., Environmental Geology (ninth edition). The McGraw-Hill Companies, Inc., New York, USA, 2011, p. 550.
2. Dhillon B.S., Mine Safety – A modern approach. Springer-Verlag London Limited 2009, p. 186.

Course Requirements and their weight in the final grade:

Attendance/Participation (<i>will be calculated as a percentage</i>)	20%
Presentations (in class)	40%

Final Exam	40%
Total:	100%

General Course Outline and Schedule

(subject to change at the instructor's
discretion)

Week	Topic	Assignments
Week 1	Introduction to the Syllabus and requirements An overview of our planetary environment.	Montgomery C.W., <i>Environmental Geology (ninth edition)</i> . 2011
Week 2	Earth, Then and Now. Life on earth. Geology, Past and Present	
Week 3	Atoms, Elements, Isotopes, Ions, and Compounds. Atomic Structure. Elements and Isotopes. Minerals Defined	Montgomery C.W., <i>Environmental Geology (ninth edition)</i> . 2011
Week 4	Plate Tectonics. Plate Tectonics—Underlying Concepts	Montgomery C.W., <i>Environmental Geology (ninth edition)</i> . 2011
Week 5	History of Waste Treatment and Disposal. Definition of waste. Waste Arisings. Municipal Solid Waste. Waste Containers, Collection Systems and Transport. Life Cycle Analysis of Materials	Montgomery C.W., <i>Environmental Geology (ninth edition)</i> . 2011
Week 6	Safety Management. Safety analysis methods & indices	Dhillon B.S., <i>Mine Safety-A modern approach</i> . 2009 Students presentation
Week 7	Human Factors and Error in Mine Safety	Dhillon B.S., <i>Mine Safety-A modern approach</i> . 2009 Students presentation
Week 8	Mining Equipment Safety	Dhillon B.S., <i>Mine Safety-A modern approach</i> . 2009 Students presentation
Week 9	Electrical accidents in mines and programmable electronic mining system safety. Gas-related, fire, and blasting accidents in mines and methods for determining mine atmosphere status	Dhillon B.S., <i>Mine Safety-A modern approach</i> . 2009 Students presentation

Week 10	Summary and Conclusion	
Week 11	Final Exam	